

Unit 13

Day 1

Algebra of Functions

$$f(x) = x - 3$$

$$g(x) = 3x + 4$$

$$D_f = (-\infty, \infty)$$

$$D_g = (-\infty, \infty)$$

$$f(x) + g(x) = f + g = x - 3 + 3x + 4 = 4x + 1$$

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$$f - g = x - 3 - (3x + 4) = -2x - 7$$

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$$fg = (x - 3)(3x + 4) = 3x^2 - 5x - 12$$

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$$\frac{f}{g} = \frac{x - 3}{3x + 4}$$

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$$\frac{g}{f} = \frac{3x + 4}{x - 3}$$

$$m(x) = \sqrt{5x}$$

$$D_m = [0, \infty)$$

$$n(x) = 8x - 1$$

$$D_n = (-\infty, \infty)$$

$$m^2 + n = (\sqrt{5x})^2 + 8x - 1 = 5x + 8x - 1 = 13x - 1$$

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$$3mn = 3(\sqrt{5x})(8x - 1) = 24x\sqrt{5x} - 3\sqrt{5x}$$

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$$n - 3m^2 = (8x - 1) - 3(\sqrt{5x})^2 = 8x - 1 - 15x = -7x - 1$$

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$$\frac{2m}{n} = \frac{2\sqrt{5x}}{8x - 1}$$

$$(f + g)(x) = f(x) + g(x)$$

$$(f - g)(x) = f(x) - g(x)$$

$$(fg)(x) = f(x) \cdot g(x)$$

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$$

$$a(x) = x^2 - 1$$

$$b(x) = 2x + 4$$

$$(a+b)(3) = a(3) + b(3) = 8 + 10 = 18$$

$$a(3) = 8 \quad b(3) = 10$$


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$$(a-b)(-2) = a(-2) - b(-2) = 3 - 0 = 3$$

$$a(-2) = 3 \quad b(-2) = 0$$


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$$(ab)(3y) = a(3y) \cdot b(3y) = (9y^2 - 1)(6y + 4)$$

$$a(3y) = 9y^2 - 1$$

$$b(3y) = 6y + 4$$

$$= 54y^3 + 36y^2 - 6y - 4$$

$$2(27y^3 + 18y^2 - 3y - 2)$$


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$$\left(\frac{a}{b}\right)\left(\frac{1}{2}\right) = \frac{a(\frac{1}{2})}{b(\frac{1}{2})} = \frac{-\frac{3}{4}}{5} = -\frac{3}{20}$$

## HOMEWORK: UNIT 13 DAY 1:

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